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CONTAINER CLOSURE ADAPTOR

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(56) Prior Art Documents  
AU 796/68 57.5  
AU 10694/52 57.5  
AU 10687/52 57.5

(57) Claim

1. A container closure adaptor comprising a body of synthetic polymeric material with an internally-threaded, wider-diameter, skirted outer wall portion connected by an intermediate, radially inwardly-extending flange wall portion to an internally or externally-threaded narrower-diameter tubular inner wall portion, an integrally-moulded internal annular sealing ring member depending axially downwards from the underside of the intermediate radially inwardly-extending flange wall portion at a radial distance intermediate the skirted outer wall portion and the tubular inner wall portion, the ring having a radially-inwardly chamfered, radially outermost face for internal sealing against the neck of a container.

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5. The adaptor as claimed in any one of claims 1 to 4 wherein the annular sealing ring has the radially outermost surface thereof chamfered radially inwardly to form a yielding tapered section to seal against the internal surface of the neck of a container, the yieldability of the yielding tapered section of the annular sealing ring member is enhanced by means of at least one annular, stress-relieving groove formed in the underside of the flange wall portion and at the base of the tapered section allowing the sealing ring to flex when in contact with the inside surface of the wall of the container neck and wherein the relative rotary movement of the annular sealing ring and radial movement of the inside surface of the wall of the neck of the plastic container enhances sealing when the sealing ring and neck move into sealing engagement.

AUSTRALIA

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643305

**COMPLETE SPECIFICATION****FOR A PETTY PATENT  
ORIGINAL****NOTICE**

1. The specification should describe the invention in full and the best method of performing it known to the applicant.
2. The specification should be typed on as many sheets of good quality A4 International size paper as are necessary and inserted inside this form.
3. The claims defining the invention must start on a new page. If there is insufficient space on this form for the claims, use separate sheets of paper. The words "The claims defining the invention are as follows" should appear before claim 1. After the claims the date and the name of the applicant should appear in block letters.
4. This form must be accompanied by (a) a true and exact copy of the description, claims and drawings (if any) and (b) an additional copy of the claims.

(see Pamphlets explaining formal requirements of specifications and drawings)

**TO BE COMPLETED BY APPLICANT**Name of Applicant: INVESTIONS PTY. LTD.Actual Inventor(s): CONSTANDINOS APPLAAddress for Service: JOHN L. DAVIES & CO. Patent Attorney of  
P.O. Box 436 /39 Cheviot Rd., Mt. Waverley, Victoria, 3149Invention Title: CONTAINER CLOSURE ADAPTORDetails of Associated Provisional Applications: Nos: PK 1218 OF 18th July, 1990

The following statement is a full description of this invention, including the best method of performing it known to me:-

This invention relates generally to container closures and relates in particular to a container closure adaptor for different types or sizes of containers for liquids. The invention also relates to an adaptor for container closures to which other closures or dispensing devices may be attached.

It is an object of this invention to provide a container closure adaptor which can be used on a variety of container of different materials such as metals or plastics materials.

Another object is to provide a means by which dispensing devices or closures of one size can be attached to containers which have inlet or outlet screw-threaded necks of different sizes.

The invention according a general aspect resides in a container closure adaptor comprising a body of synthetic polymeric material with an internally-threaded, wider-diameter, skirted outer wall portion connected by an intermediate, radially inwardly-extending flange wall portion to an internally or externally-threaded narrower-diameter tubular inner wall portion, an integrally-moulded internal annular sealing ring member depending axially downwards from the underside of the intermediate radially inwardly-extending flange wall portion at a radial distance intermediate the skirted outer wall portion and the tubular inner wall portion, the ring having a radially-inwardly chamfered, radially outermost face for internal



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sealing against the neck of a container.

According to one form of the adaptor of this invention the narrower-diameter inner tubular wall portion forms a neck upstanding from the flange wall portion, the base of the neck extending vertically below the horizontal level of the flange wall portion of the adaptor, an annular channel being formed at the base of the neck to allow an internally-threaded, combination container-closure, pouring spout and dispensing device to be attached to the closure adaptor and wherein the height of the neck of the closure adaptor is not greater than the rim flange of a drum when the adaptor is fitted to the drum.

According to another form of the adaptor of this invention, the internally-threaded, wider-diameter, skirted outer wall portion is connected to an externally-threaded, narrower-diameter tubular cylindrical inner wall portion by a flat, unthreaded outer intermediate radially inwardly-extending outer flange wall portion, an axial unthreaded wall portion and a radially inwardly- extending inner flange wall portion countersunk with respect to the outer flange wall portion, the sealing ring being adapted to seal against the neck of a metal drum and there is formed a single, deep, axially- extending groove between a radially-outward face of the axial, unthreaded wall portion and a radially-inward face of the annular sealing ring.



According to another form of the adaptor of the present invention, the internally-threaded, wider-diameter, skirted outer wall portion is connected by an intermediate, radially inwardly-extending flange wall portion to an internally threaded, narrower-diameter tubular inner wall portion countersunk into the flange wall portion. and the internal annular sealing member is formed on and depends axially downwards from the underside of the flange wall portion at a radial distance intermediate the skirted outer wall portion and the tubular inner wall portion for sealing against the neck of a metal drum.

Preferably, the annular sealing ring has the radially outermost surface thereof chamfered radially inwardly to form a yielding tapered section to seal against the internal surface of the neck of a container, the yieldability of the yielding tapered section of the annular sealing ring member is enhanced by means of at least one annular, stress-relieving groove formed in the underside of the flange wall portion and at the base of the tapered section allowing the sealing ring to flex when in contact with the inside surface of the wall of the container neck and wherein the relative rotary movement of the annular sealing ring and radial movement of the inside surface of the wall of the neck of the plastic container enhances sealing when the sealing ring and neck move into sealing engagement. More preferably, the adaptor has two stress-relieving grooves, one on



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each side of the base of the sealing ring.

5 Preferably, there is provided on top of the intermediate radially inwardly-extending flange wall portion of the adaptor, a lug for engagement with internal saw teeth in a base of a combination closure, pouring spout and dispensing device to hold the device against rotation while an upper turnable part of the said device is being operated by a user.

~~The relative rotary movement of the annular sealing ring and inside surface of the wall of the neck of the plastic container enhances sealing when these parts move into sealing engagement.~~

5           Some non-limiting examples of the invention in the form of multiple embodiments and modifications and adaptations thereof will now be described with reference to the accompanying drawings, in which:

10           Figure 1 is vertical section of one embodiment of a container closure adaptor device suitable for use upon a plastic can.

          Figure 1A is a vertical section of the neck portion of a plastic container to which the adaptor of Figure 1 may be fitted.

15           Figure 2 is a vertical section of a second embodiment of the adaptor of the invention.

          Figures 3 and 3A are vertical sections of a third embodiment of the adaptor of the invention applicable to metal drums.

20           Figure 3B is a bung for fitment to the adaptor of Figure 3.

          Figure 4 is a vertical section of a modification of the embodiment of the invention of Figure 1 of the drawings.

25           Figure 5 is similar to Figure 4 but applicable to Figure 2.

          Figure 6 is similar to Figures 4 and 5 but applicable to Figure 3.



rupturable seal added to the embodiment of Figure 6.

Figure 8 is a similar view to Figure 7 of another rupturable seal.

Figure 9 is a similar view to Figures 8 and 9 of another ruptrurable seal.

Figure 10 is a half sectional view in a valve closed position of a combination closure, dispensing and pouring accessory device which can be used in conjunction with the adaptor according to the present invention.

Figure 11 is the same device as in as Figure 10 but in open or dispensing and pouring position.

Figure 12 is an inverted plan view of the pouring dispenser device of Figures 10 and 11.

Referring to the first embodiment of the invention and the subject of Figure 1 of the drawings, there is shown a container closure adaptor device 10 in the form of a squat tubular body made by injection moulding from a synthetic polymeric material or materials such as high density polyethylene or polypropylene monomers or co-polymers the body is formed with a wider-diameter outer and lower-level wall portion 11 forming a skirt with an internal screw thread 12 thereon and a narrower-diameter, higher-level wall forming a male neck portion 13 which has an external screw thread 14 thereon. The outer side wall and inner neck wall portions of the adaptor device are joined by an annular lateral or intermediate top wall portion 15 which has projecting downwards from the underside

thereof and at a radial distance partway between the outer skirted wall portion and inner neck wall portion and integrally formed with the device, an annular sealing ring 16 which has the radially outermost face thereof chamfered radially inwardly to form a sealing face 17 to seal against internal face 18 of the neck 19 of a container 20 when the adaptor is screwed onto the threaded neck 19 of the container 20 shown in Figure 1A below the adaptor shown in Figure 1.

Referring to the second embodiment of the invention the subject of Figure 2 of the drawings, there is shown a container closure adaptor 210 similar to that of Figure 1 except that the base of the neck has a threaded recess in the form of an annular channel 220 which will allow the internally threaded lower end portion of a combination closure, dispensing device and pouring spout such as that shown in Figures 7 and 8 of the drawings accompanying this application, the latter device being the subject of a separate, co-pending patent application No. PJ 5792 lodged 16th August, 1989 in the name of Applia and completed under No. 61,023/90 on 16th August, 1990, which accessory device is adapted to be screwed onto the adaptor of the present invention after the adaptor has been screwed onto the externally threaded neck of a plastic container as shown in Figure 1A or onto the spout of a metal can or drum. The purpose or function of the recess channel 220 is to provide extra threaded length to accommodate accessories

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the height of the closure adapter does not exceed the height of a flange of a drum to permit stacking of drums. For fitment of the pouring spout closure accessory of Figures 10 and 11 there is provided a lug 21 on the top or lateral wall of Figure 1, 221 in Figure 2 and 523 of Figure 5; this lug engages with the internal saw teeth of the pourer of Figure 12 and holds the lower part of the spout against rotation while the upper or turnable part of the valve is being operated by a user.

Referring to the embodiment of Figure 3 there is shown a container closure adaptor 310 similar to that of Figures 1 and 2 in most respects except that the male neck portion is now modified into a female functional portion which is countersunk and level with the top or lateral wall portion 315 of the adaptor 310 and is internally threaded with thread 314 rather than externally threaded as in the male neck versions of Figures 1 and 2 of the drawings. In the embodiment of Figure 3, the lower level skirted outer wall portion remains the same but, for clarity is now designated 311, the external thread thereof is 312, the internal female threaded portion of the countersunk "neck" is designated 313.

As shown in Figures 7 to 9, if desired the recessed or countersunk female threaded portion of the adaptor may be formed with a different types of rupturable membrane seal which can be a convex bottom seal 317 as in Figure 7, a straight bottom seal 318 of

Figure 8, or a straight top seal 319 as in Figure 8 formed thereon to create access to the bung hole of a drum or the like by insertion of a threaded tap whereby screw-in action of the tap breaks the seal. The embodiment of Figure 3 also has formed thereunder an annular sealing ring 318 and a chamfered external sealing surface 318a, the ring being tapered from top to bottom.

In Figure 3A there shown the externally threaded opening of a metal drum.

In Figure 3B there is shown a removable bung 316 for the adaptor of Figure 3.

In the separate embodiments of Figures 4 to 6 of the accompanying drawings there is shown a modification to the three embodiments of the closure adaptor of Figures 1, 2 and 3 of the drawings, namely the addition of two annular grooves 421, 422 in Figure 4; 521, 522 in Figure 5; and 621, 622 in Figure 6. These grooves are at the base of the annular sealing ring now designated 416, 516, and 616 on Figures 4 to 6 respectively and which act as stress relievers to enhance flexibility of the ring seal when the adaptor is being screwed onto the threaded neck of a plastic container.

It will be appreciated that, if desired a threaded cap can be fitted upon the adaptor of Figures 1, 2, 4 and 5 of the drawings of the present application.

The claims defining the invention are as follows:

1. A container closure adaptor comprising a body of synthetic polymeric material with an internally-threaded, wider-diameter, skirted outer wall portion connected by an intermediate, radially inwardly-extending flange wall portion to an internally or externally-threaded narrower-diameter tubular inner wall portion, an integrally-moulded internal annular sealing ring member depending axially downwards from the underside of the intermediate radially inwardly-extending flange wall portion at a radial distance intermediate the skirted outer wall portion and the tubular inner wall portion, the ring having a radially-inwardly chamfered, radially outermost face for internal sealing against the neck of a container.

2. The adaptor as claimed in claim 1, wherein the narrower-diameter inner tubular wall portion forms a neck upstanding from the flange wall portion, the base of the neck extending vertically below the horizontal level of the flange wall portion of the adaptor, an annular channel being formed at the base of the neck to allow an internally-threaded, combination container-closure, pouring spout and dispensing device to be attached to the closure adaptor and wherein the height of the neck of the closure adaptor is not greater than the rim flange of a drum when the adaptor is fitted to the drum.



3. The adaptor as claimed in claim 1 wherein the internally-threaded, wider-diameter, skirted outer wall portion is connected to an externally-threaded, narrower-diameter tubular cylindrical inner wall portion by a flat, unthreaded outer intermediate radially inwardly-extending outer flange wall portion, an axial unthreaded wall portion and a radially inwardly-extending inner flange wall portion countersunk with respect to the outer flange wall portion, the sealing ring being adapted to seal against the neck of a metal drum and there is formed a single, deep, axially-extending groove between a radially-outward face of the axial, unthreaded wall portion and a radially-inward face of the annular sealing ring.

4. The adaptor as claimed in claim 1, wherein the internally-threaded, wider-diameter, skirted outer wall portion is connected by an intermediate, radially inwardly-extending flange wall portion to an internally threaded, narrower-diameter tubular inner wall portion countersunk into the flange wall portion, and the internal annular sealing member is formed in and depends axially downwards from the underside of the flange wall portion at a radial distance intermediate the skirted outer wall portion and the tubular inner wall portion for sealing against the neck of a metal drum.

5. The adaptor as claimed in any one of claims 1 to 4 wherein the annular sealing ring has the radially

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outermost surface thereof chamfered radially inwardly to form a yielding tapered section to seal against the internal surface of the neck of a container, the yieldability of the yielding tapered section of the annular sealing ring member is enhanced by means of at least one annular, stress-relieving groove formed in the underside of the flange wall portion and at the base of the tapered section allowing the sealing ring to flex when in contact with the inside surface of the wall of the container neck and wherein the relative rotary movement of the annular sealing ring and radial movement of the inside surface of the wall of the neck of the plastic container enhances sealing when the sealing ring and neck move into sealing engagement.

6. The adaptor as claimed in claim 5 wherein there are two stress-relieving grooves, one on each side of the base of the sealing ring.

7. The adaptor as claimed in any one of claims 1 to 6 wherein there is provided on the top of the intermediate radially inwardly-extending flange wall portion a lug for engagement with internal saw teeth in a base of a combination closure, pouring spout and dispensing device to hold the device against rotation while an upper turnable part of the said device is being operated by a user.



8. A container closure adaptor substantially as hereinbefore described with reference to Figure 1 of the accompanying drawings.
9. A container closure adaptor substantially as hereinbefore described with reference to Figure 2 of the accompanying drawings.
10. A container closure adaptor substantially as hereinbefore described with reference to Figures 3 and 3A of the accompanying drawings.
11. A container closure adaptor substantially as hereinbefore described with reference to Figure 4 of the accompanying drawings.
12. A container closure adaptor substantially as hereinbefore described with reference to Figure 5 of the accompanying drawings.
13. A container closure adaptor substantially as hereinbefore described with reference to Figure 6 of the accompanying drawings.
14. A container closure adaptor substantially as hereinbefore described with reference to Figure 7 of the accompanying drawings.
15. A container closure adaptor substantially as hereinbefore described with reference to Figure 8 of the accompanying drawings.



[illegible]

Trial	Control (n=10)	MCI (n=10)	AD (n=10)
1	75	75	70
2	80	78	72
3	82	80	75
4	85	82	78
5	90	85	80



## ABSTRACT

An adapter of plastics material (10) enables a dispensing closure with a pouring spout to be fitted to plastic containers or plastic containers with threaded necks (19) and has an outer, internally-threaded wall portion (11) connected by a flat intermediate lateral wall portion (15) to an inner, externally-threaded wall portion (14) which forms a connecting neck for the skirted, internally-threaded bottom of the dispenser closure and pouring spout member the adaptor has an annular, integrally-moulded, deformable sealing ring (16) which depends from the underside of the flat connector portion (15) and is positioned at a radial distance between inner and outer wall portions and has an outer wall surface (17) chamfered to obtain a yieldable tapered section in axial direction enabling sealing against shoulder and neck of plastic containers and against the neck of metal containers; in one form there is a stress-relieving annular groove (221) at the base of the annular sealing ring to enhance yieldability and allow the ring (16) to flex when in contact with the inside surface of the wall of the container neck (19) in other forms there are stress-relieving annular grooves (421, 422, 521, 522, 621, 622)

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FIG. 1

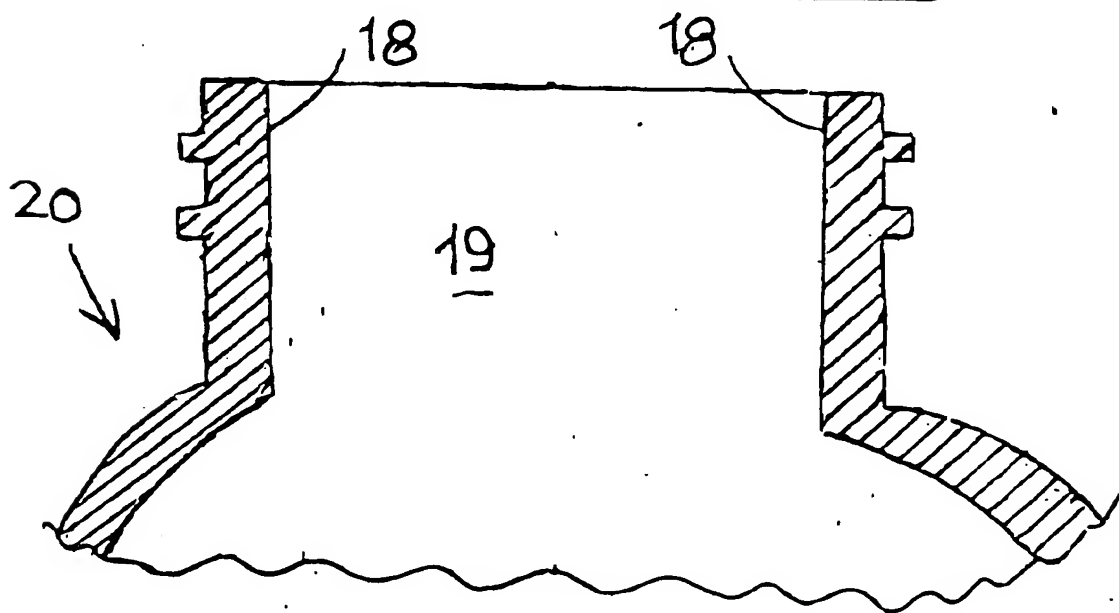
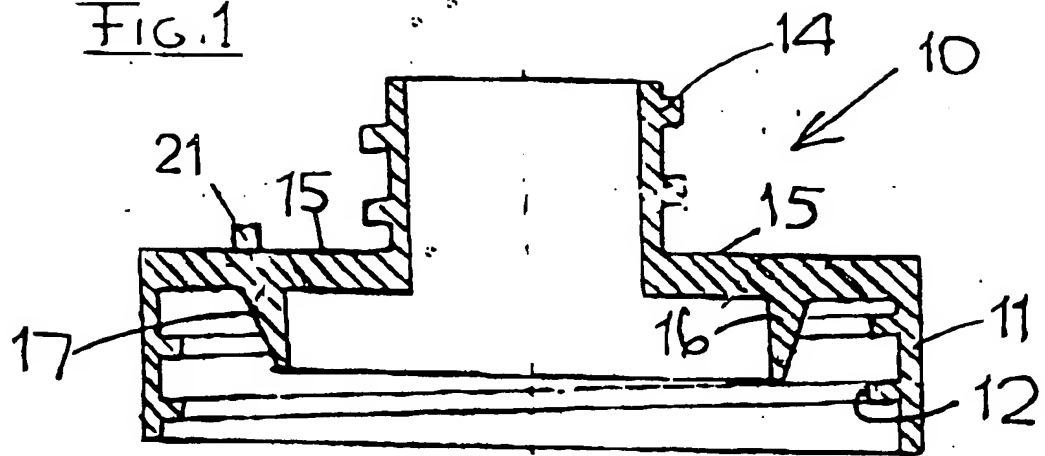


FIG 1A

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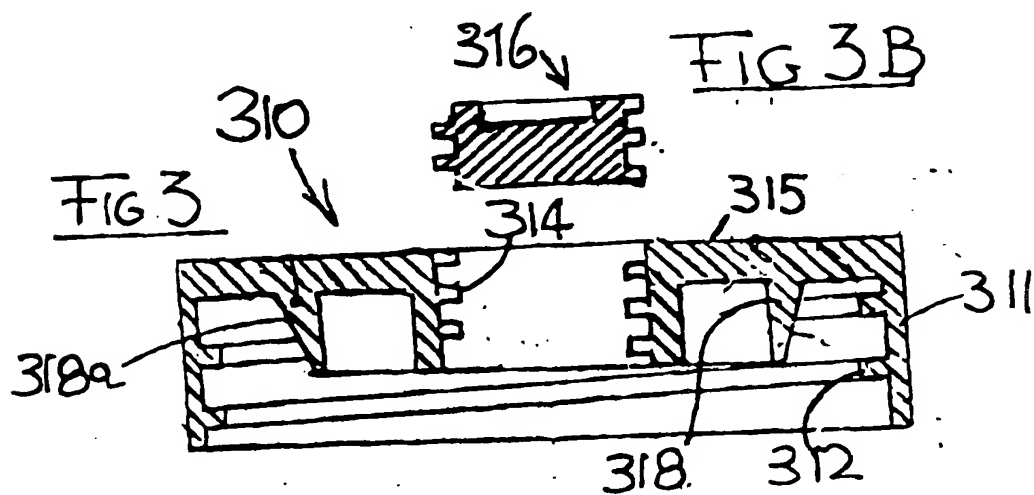
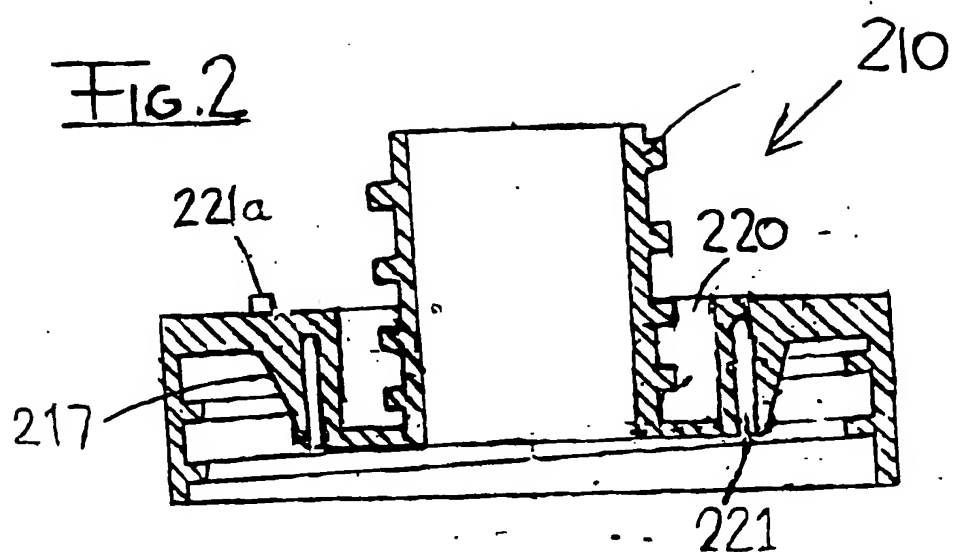


FIG 3A

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FIG 4

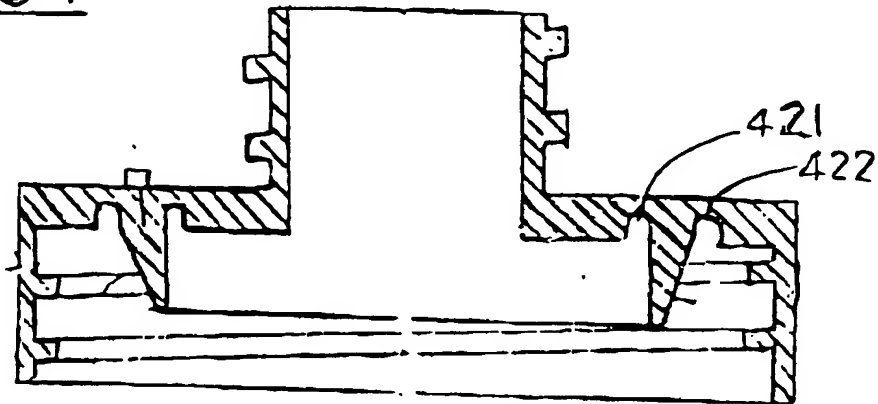


FIG 5

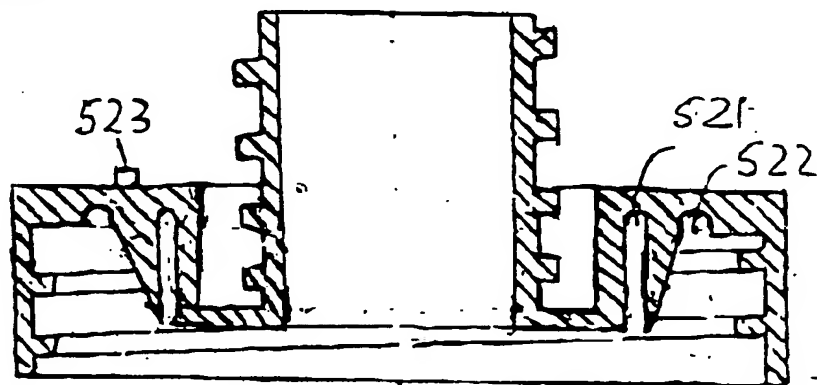


FIG 6

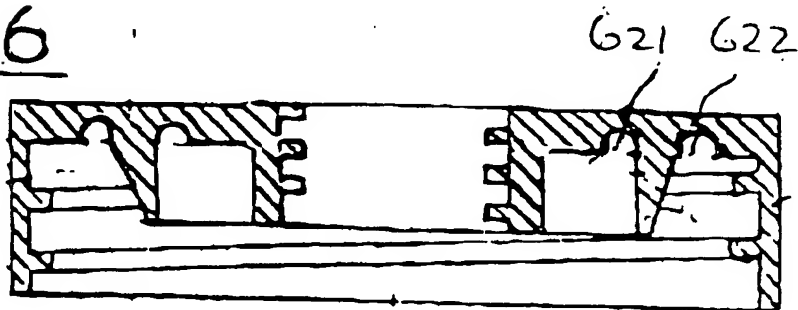


FIG. 7

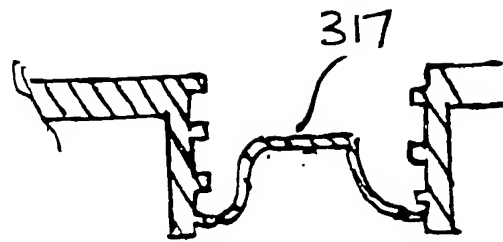


FIG 8

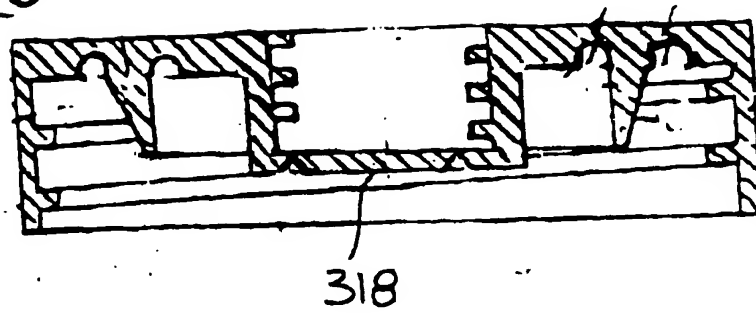
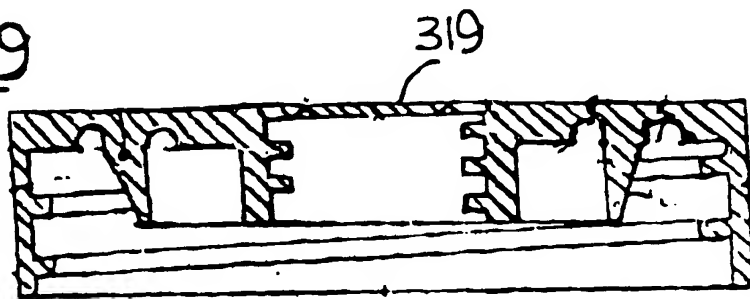
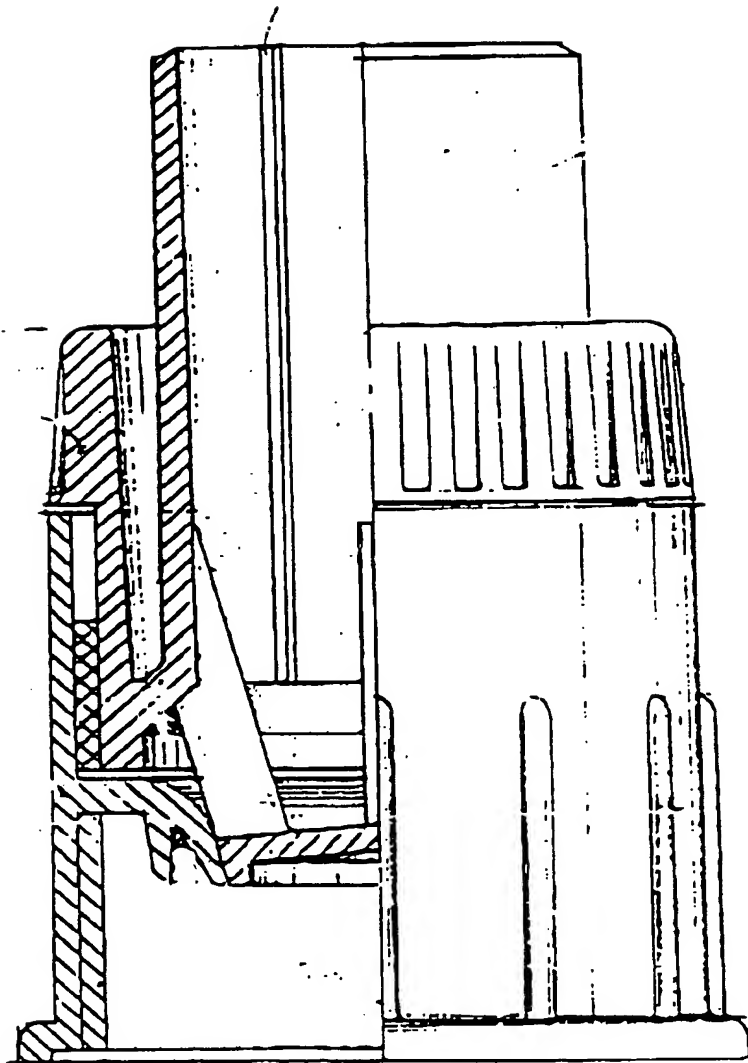


FIG 9



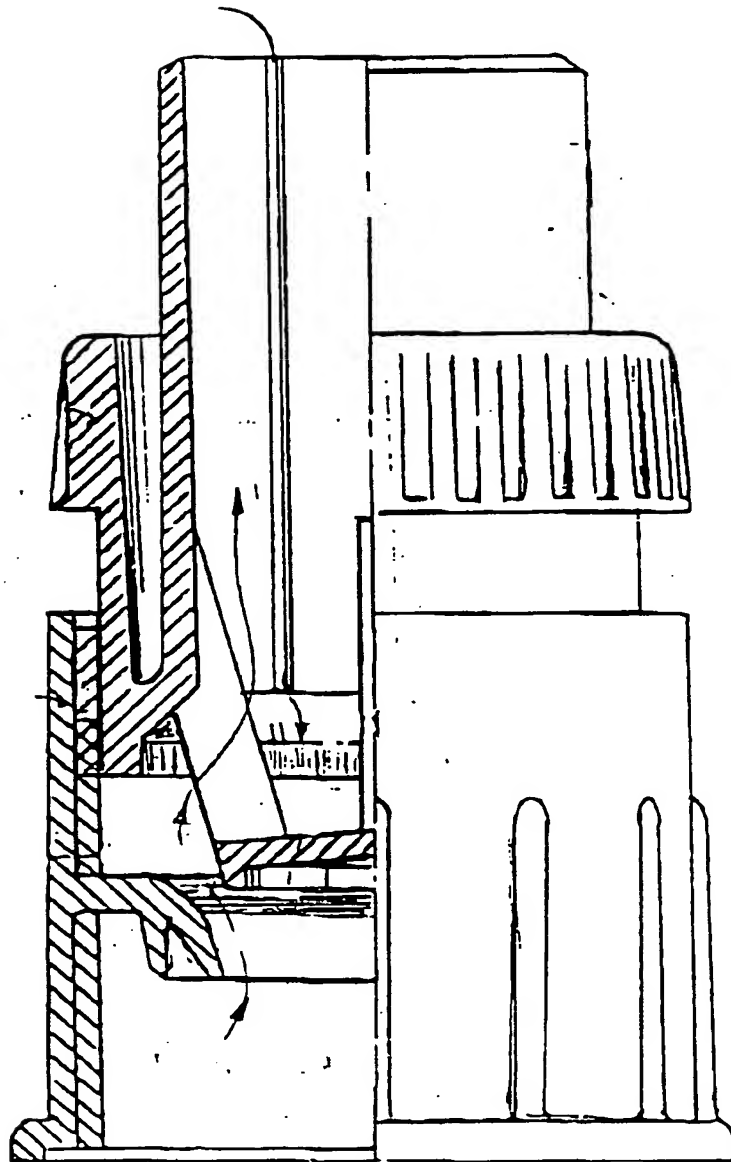
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FIG. 10



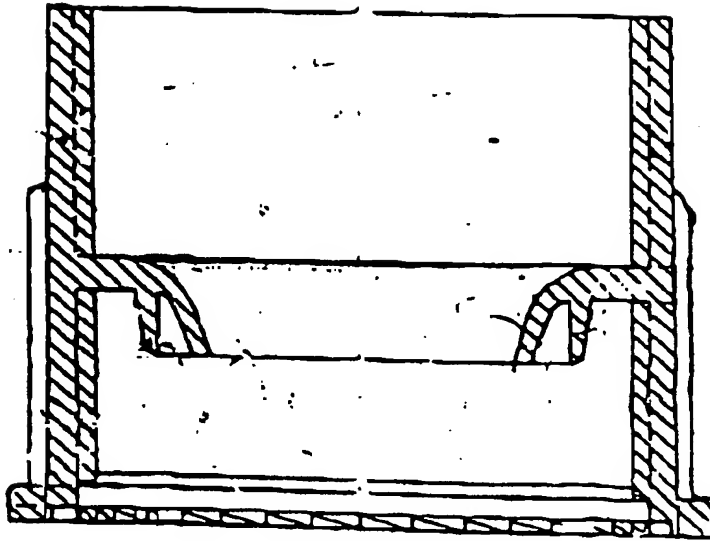
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FIG. 11





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FIG. 12



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